

Exploring the gluon polarization using inclusive jet and dijet production in polarized proton-proton collisions at $\sqrt{s} = 510$ GeV at RHIC

Bernd Surrow (On behalf of the STAR Collaboration)

Temple University, College of Science and Technology, Department of Physics
Philadelphia, PA 19129

surrow@temple.edu

One of the primary goals of the RHIC spin program is to determine the polarized gluon distribution function, Δg , within the proton. At the leading order, proton-proton collisions involve a mixture of quark-quark, quark-gluon, and gluon-gluon scatterings. At RHIC kinematics, the quark-gluon and gluon-gluon contributions dominate, which makes RHIC an ideal tool to study Δg .

The STAR Collaboration has recently published measurements of the longitudinal double-spin asymmetry, A_{LL} , for inclusive jet and dijet production at midrapidity in polarized proton-proton collisions at a center-of-mass energy of $\sqrt{s} = 510$ GeV, based on the high luminosity data sample collected by the STAR experiment in 2013. These measurements complement and improve the precision of previous STAR measurements at the same center-of-mass energy that probe the polarized gluon distribution function within the partonic momentum fraction range of $0.015 \lesssim x \lesssim 0.25$. The dijet asymmetries are separated into four jet-pair topologies and measured with good precision at low dijet invariant mass, which provide further constraints on the x dependence of the polarized gluon distribution function. These recently published midrapidity A_{LL} results will be presented and compared to previous measurements, along with comparisons to current next-to-leading-order global analyses.